REPORT

OF THE

CHEMICAL ANALYSER TO GOVERNMENT, BOMBAY,

FOR THE YEAR 1891.

THE

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REPORT

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FOR THE YEAR 1891.

To

THE SECRETARY TO GOVERNMENT,
General Department,
Bombay.

SIR,

I have the honour to submit the following report for the year 1891, being the Twenty-first Annual Report of this Department.

2. The work done during the past year may be thus summarized :—321 medico-legal cases in the investigation of which 1,307 articles were examined; 396 samples of potable water and 1,603 samples of Government stores and other articles classed as "Miscellaneous" were analysed, the gross total of articles under examination during the year under report being 3,306.

3. In the following table is shown the number of cases examined during the last five years arranged in their respective classes :—

Class.	1887.	1888.	1889.	1890.	1891.
Medico-legal cases	282	360	312	353	321
Potable waters	207	280	260	250	396
Government stores	355	500	221	298	664
Customs and A'bkári analyses ...	652	598	773	747	859
Miscellaneous	52	54	53	107	80
Total ...	1,548	1,792	1,619	1,755	2,320

From the above table it will be seen that the total number of cases is the highest on record, being 565 higher than the corresponding number for the previous year, the total number of articles examined being more than 500 greater. During the last two or three years, attention has been invited to the rapidly increasing work of this Laboratory and the inability of the present staff to cope with it. During the year under report, with the enormous increase of just one-third more cases than in the previous year, it has been in many cases absolutely impossible to issue reports until weeks and even months after the cases were received for analysis. The increase of establishment which is now sanctioned by Government and which will commence work at the beginning of the next official year, comes as an acceptable addition to the strength of the Laboratory, yet it seems highly probable that a further increase will shortly be needed if the incoming work continues to advance by such rapid strides. This increase is due principally to the large number of cases referred by the Commissariat Department, samples from this department alone shewing an increase of 360 above those of the previous year, the largest number being samples of condemned malt liquor, of which no less than 370 were referred from various stations for examination and report. The water samples also shew an increase of 146 upon the previous year and Customs samples an increase of 112, these being mainly due to the large number of samples of alcoholic, or supposed alcoholic liquids forwarded for estimation of proof spirit. The number of medico-legal cases shows a slight diminution as compared with the past year.

Section I.—Medico-Legal.

4. The medico-legal cases investigated by this department during the year 1891 were forwarded from 124 different stations and are arranged in three classes as follows:—Class (1) cases of suspected human poisoning; class (2) cases of suspected cattle-poisoning; class (3) miscellaneous cases, principally

cases of staining with blood, &c. The 321 medico-legal cases investigated during the year 1891 are referred to their respective classes as follows :—

Class 1 ... ... 151 cases.
„ 2 ... ... 114 „
„ 3 ... ... 56 „

The following table gives the corresponding number of cases during the past five years :—

Class.	1887.	1888.	1889.	1890.	1891.
1. Suspected human-poisoning ...	159	182	170	190	151
2. do. cattle-poisoning ...	84	91	84	117	114
3. Blood stains, &c.	39	87	58	46	56
Total ...	282	360	312	353	321

Class I.—Cases of suspected human poisoning.

5. Of the 151 cases belonging to this class, and investigated during the past year, poison was detected in 75 or 49·0 per cent., a larger percentage than the corresponding one of last year. The following table shows the percentage of cases wherein poison was detected during the past five years :—

	1887.	1888.	1889.	1890.	1891.
Percentage of detections, ...	52·8	46·2	36·8	35·3	49·6

From the preceding table it will be seen that the percentage of cases wherein poison was found is higher than during the three previous years. This is most satisfactory, taking into consideration the comparatively smaller number of cases of this class forwarded for examination during the year, indicating as it does, the exercise of more care on the part of officers forwarding the articles, in selecting cases fit for analysis : the reports of *post-mortem* examinations and histories of the various cases have also been more carefully compiled than in previous years.

6. In the following table is shown the nature of the poison found in each of the 75 cases of human poisoning in which poison was detected during the year under report. The cases are tabulated according to the districts from which they were forwarded :—

Districts.	Arsenic.	Pounded Glass.	Other Mineral Poisons.	Opium.	Dhatura.	Other Organic Poisons.	Total.
Ahmedabad	...	...	...	1	1	1	3
Ahmednagar	3	...	...	...	...	...	3
Belgaum	...	...	...	...	...	1	1
Bombay	2	...	1	...	...	3	6
Broach	1	...	...	...	...	...	1
Kaira	2	...	...	2	...	...	4
Kaládgi	2	1	1	...	...	...	4
Kánara	1	...	...	1	...	...	2
Khándesh	3	...	...	...	...	...	3
Kolába	1	...	...	1	...	...	2
Násik	1	...	...	2	...	...	3
Nasirabad	1	...	...	1	1	...	3
Neemuch	1	...	...	...	1	...	2
Poona	2	...	...	...	...	1	3
Sátára	3	...	4	...	...	...	7
Sholápur	...	1	2	1	...	...	4
Sind	3	...	1	...	...	1	5
Surat	...	...	...	...	...	1	1
Thána	3	...	...	1	...	...	4
Total ...	29	2	9	10	3	8	61
Native States	9	...	...	...	1	...	10
Central Provinces and Berárs	2	...	...	1	1	...	4
Grand Total ...	40	2	9	11	5	8	75

7. As far as can be ascertained from the reports furnished to this office, the 75 cases of human poisoning in which some poison was detected during the past year included the poisoning of 232 persons, of whom 50 died. The unusually large number of persons poisoned as compared with former years is principally due to one case of copper poisoning referred to specially in paragraph 15 in which 137 persons were poisoned at a feast. The following table shows the number of cases in which poison was detected, as well as the number of persons poisoned and the number of deaths during the past five years :—

	1887.	1888.	1889.	1890.	1891.
A.—Cases—					
Arsenic	42	41	33	32	40
Opium	14	15	20	9	11
Dhatura	5	5	3	4	5
Other poisons	23	23	10	22	19
Total Cases ...	84	84	66	67	75
B.—Persons poisoned—					
Arsenic	47	59	51	51	47
Opium	13	15	25	9	15
Dhatura	21	9	3	13	7
Other poisons	14	19	4	14	163
Total persons poisoned ...	95	102	83	87	232
C.—Deaths—					
Arsenic	20	26	14	21	26
Opium	13	14	18	9	5
Dhatura	2	1	2	2	...
Other poisons...	2	7	1	3	19
Total Deaths ...	37	48	35	35	50

The figures from the above table give the following percentages of deaths for each poison in the cases where the poison was actually detected :—

Arsenic	65·0 per cent.
Opium	45·4 „
Other poisons	100·0 „

It will be observed that the percentage of deaths from arsenic and opium is smaller than that for the previous year, the percentage for that year being 65·6 for arsenic and 100·0 for opium.

8. The following is a detailed statement showing the poison found in each of the 75 cases of Class I above referred to :—

	Rs.
Arsenious oxide	40
Copper	8
Mercury	1
Pounded glass	2
Opium	11
Dhatura	5
Strychnia	4
Aconitia	1
Other poisons	2
Chloroform	1
Total ...	75

9. *Arsenic.*—Of the 40 cases in which this poison was detected during the past year, 4 were cases in which more than one person was poisoned. These 4 cases include the poisoning of 11 persons, of whom 4 died. The following is a summary of the cases referred to :—(1) a case from Sangamner (Ahmednagar District) in which two children, boy and girl, aged 4½ years, were given by the uncle of the girl some bread which he had obtained by begging. Shortly after

eating this bread, both children exhibited symptoms of irritant poisoning and died in a few hours. Arsenic was found in the viscera of the children and also in the bread of which they had partaken: (2) a case from Nasirabad in which a Sowar of the Second Bombay Lancers, who had received by post a packet of sweetmeat balls, ate some of them and gave some to three of his comrades. All four men suffered from vomiting and purging and the first-mentioned man died in the evening of the same day. Arsenic was detected in the viscera and also in the vomit of one of the three men who recovered, as well as in the sweetmeat balls: (3) a case from Karád (Sátára District) where the food and vomit of a woman and her son, who displayed symptoms of irritant poisoning, were found to contain arsenic, but no further history is afforded: (4) a case from Daphlapur (Bijápur District) in which a woman, wishing to put an end to a man's life, prepared some sweetmeat balls, and in order to try their effect, gave some to a girl who in turn gave some of it to her sister and to a boy aged 3 years. All suffered from vomiting and purging, and the boy died, arsenic being found in his viscera and in the cloth in which the sweetmeat balls had been wrapped.

10. In the remaining 36 cases in which arsenic was detected during the past year, 22 were fatal, one person being poisoned in each case, the remaining 14 being samples of food and powders containing arsenic. Of the 22 deaths, 12 were men, 4 women and 6 children. Of the 12 cases in which male adults were poisoned, 8 appear to be homicidal, 1 suicidal and in 3 no history was given. These 12 cases were:—(1) a case from Bombay in which arsenic was found in the viscera of a man who was supposed to have died from having drunk the juice of a plant: (2) a case from Jambusar (Broach District), where a man after suffering from the usual symptoms of irritant poisoning, died, arsenic being detected in his viscera: (3) a case from Ahmednagar in which a man went out for a walk in the evening in company with another man who gave him some sweetmeat to eat. He appears to have become unconscious, for he awoke to find himself in the jungle and began to vomit. He made his way home with difficulty and died in a few hours. Arsenic was detected in his viscera and a powder, discovered in possession of the accused, was found to consist of pure arsenious oxide or "white arsenic": (4) a case from Jalgaon (Khándesh District) in which a man who was on his way from a village near Jalgaon, where he was summoned to attend as a witness in some legal case, sat down on the bank of a nála and ate his food; he appears to have become insensible and remained there all night. On being found he was taken to the Jalgaon Dispensary, and there died after exhibiting symptoms of irritant poisoning, and arsenic was found in the viscera: (5) a case from Sángli (Southern Mahratta Jághírs) in which a man, after eating some sugar, suffered from purging and vomiting and eventually died, arsenic being found in the viscera; no further history of this case was obtainable: (6) a case from Kambar (Shikárpur District) in which arsenic was found in the viscera of a man whose wife tried to poison him "in order to be able to take another husband": (7) a case from Páli (Márwár) in which arsenic was detected in the stomach of a man, but no further history is available: (8) a case from Indi (Kaládgi District). In this case, a woman applied to a Mahár for a "charm, to stop the quarrelling of her husband"; this she obtained in the form of a white powder which she gave to her husband in his food. The "charm" appears to have succeeded, for the man died shortly afterwards, and a dog who also ate some of the food died also. Arsenic was found in the viscera of the man and also of the dog: (9) a case from Igatpuri (Násik District) in which a man employed on the G. I. P. Railway suffered from vomiting and purging and died shortly after, nothing further being known as to how the poison was administered.

11. *Arsenic continued.*—(10) A case from Patur (Akola District) in which arsenic was detected in the viscera of a man, no further history being forwarded: (11) a case from Sujan (Oodeypur). In this case the friends of a girl, who was about to become the wife of a man whom they objected to, are supposed to have placed poison in his food, the food having given rise to symptoms of irritant poisoning with a fatal result; arsenic was found in the viscera: (12) a case from Kaira in which arsenic was found in the vomit of a man supposed to have committed suicide.

12. Of the 4 cases among female adults, 1 appears to be homicidal and in the three remaining cases no history was obtainable. These cases were: (13) A case from Poona in which a woman was given some "medicine" by another woman and shortly after taking it she suffered from severe abdominal pain and eventually died, arsenic being found in her viscera: (14) a case from Alíbág (Kolába District) in which a woman was supposed to have died after abortion; arsenic was found in the viscera, having probably been taken as an abortifacient: (15) a case from Gohelvád (Káthiáwár District) in which arsenic was detected in the viscera of a woman "found dead": (16) a case from Oodeypur, where a woman was supposed to have died of "opium poisoning," but arsenic was found in the viscera. The 6 cases of fatal poisoning of children by arsenic were:—(17) A case from Bágevádi (Kaládgi District) in which a boy, who was the next heir to some property, was poisoned by his relatives, arsenic being found in his viscera: (18) a case from Hyderabad (Sind), where a boy aged three was given some treacle by his uncle; after eating it, he vomited and died shortly afterwards; arsenic was found in his viscera: (19) a case from Secunderabad (Hyderabad Deccan) in which a child picked up a packet of white powder near an ash-pit and ate it, dying shortly after, arsenic being found in the viscera: (20) a case from Karad (Sátára District) in which a boy died, and (21 and 22) two cases from Amráoti (Berár) and Sehwan (Sind District) respectively in which two girls died, no history being obtainable of these cases; arsenic was detected in the viscera in each case.

13. The remaining 14 cases in which arsenic was detected were:—(1) A case from Neemuch: (2) a case from Kumta (Kánara District) in each of which arsenic was detected in the vomit of the deceased persons: (3) a case from Thána: (4) a case from Umbargaon (Thána District): (5) a case from Sádra (Mahi Kántha State): (6) a case from Poona: (7) a case from Sátára. In each of these five cases, powders of arsenious oxide were forwarded for identification. With regard to cases 3 and 4 no points of interest are recorded. In case No. 5 the arsenic was found at the bottom of a drinking vessel containing water. In case No. 6 a powder containing arsenious oxide was sent by the Assistant Civil Surgeon of Poona in connection with the poisoning of an European nurse residing at Poona. It appears that her servant robbed her of some money kept in a box in her room while she was lying ill in bed; the servant thinking he had been seen, locked the door on the outside; shortly after he sent her some soup, in which he is stated to have placed some powder which was afterwards found in his possession and which he obtained from a quack doctor. The powder proved, as above stated, to be "white arsenic." In case No. 7 (Sátára) the powder was stated to have been found amongst the ashes of a corpse. This is a very transparent fraud, but rather a favourite one amongst the natives of this Presidency. The intention is obviously to suggest poisoning of the deceased in order to implicate some enemy on a charge of homicide; but as arsenic volatilises with very moderate heat, it is absolutely impossible that any of it could be present after cremation in the open air, except it were added to the ashes after the process were completed and the fire extinct: (8) a case from Thána: (9) a case from Párner (Ahmednagar District): (10) a case from Bombay: (11) a case from Dhulia (Khándesh District): (12) a case from Nandurbár (Khándesh District): (13) a case from Kaira: (14) a case from Secunderabad (Hyderabad Deccan).

In these seven cases, arsenic was found in various articles of food, no special points of interest being recorded.

14. *Pounded Glass.*—Two cases of attempted poisoning with pounded glass were forwarded for examination during the year:—(1) A case from Muddebihál (Kaladgi District) and (2) a case from Karmála (Sholápur District). In both of these cases powders were forwarded which proved upon an analysis to contain fragments of pounded green glass. In case No. 1 the powder was found on the person of the accused who was arrested on suspicion, but it does not appear to have been used as a poison. In case No. 2 the powder produced symptoms of irritant poisoning in three persons to whom it was given in some religious ceremony. In this case a small quantity of powdered blue vitriol (sulphate of copper) was also found mixed with the glass. The glass was probably derived in both cases from glass bangles finely pounded.

15. *Copper.*—This poison was found in eight cases: (1, 2, 3, 4) cases from Sátára, the first of which was one of wholesale poisoning, apparently accidentally produced by the use of untinned copper pots in which the food of 200 persons who were invited to a feast was prepared; 137 of the number are stated to have suffered from vomiting and purging and ten died. Copper was detected in the contents of several of the pots. In case No. 2 several powders were forwarded, one being found to consist of Schule's green (arsenite of copper) and another red lead, the rest being inert. In case No. 3, copper was found in the food (jágri) of eight persons, all of whom exhibited symptoms of irritant poisoning. In case No. 4, a woman complained of having been poisoned by the food which she had eaten in a friend's house—a powder, stated to have been found there, consisted of sulphate of copper, but the food was free from poison: (5) a case from Bombay, where a woman died after severe abdominal pain, and the undue haste in making the funeral arrangements gave rise to suspicion and the funeral proceedings were stopped. Copper was found in the viscera: (6) a case from Sholápur, where a few crystals forwarded were found to be sulphate of copper: (7) a case from Aklúj (Sholápur District) in which some bread cakes given to a young woman by her mother were found to contain blue vitriol: from the history of this case it would appear that the poison was probably given as an abortifacient: (8) a case from Bágalkot (Kaládgi District) where a packet of copper sulphate was forwarded with the viscera of a man who died under suspicious circumstances, no poison was found, however, in the viscera.

16. *Mercury.*—One case from Jacobabad (Sind) was forwarded for examination, in which mercury was found in sweetmeat which had caused purging in a man who had eaten some of it—the sweetmeat was given him by a woman, but no further history was recorded.

17. *Opium.*—Eleven cases of opium poisoning were forwarded for analysis, five of which were fatal. In each of the 5 fatal cases, a single death occurred, 1 being a girl and 4 male adults. Of these 5 cases, 2 are apparently homicidal and 3 suicidal. These were:—(1) A case from Alibág (Kolába District) in which a girl was supposed to have been poisoned by her sister-in-law, opium being found in the viscera: (2) a case from Akola (Berár) in which opium was found in the food of a man who died, his wife having confessed to having placed "aconite" in his food: (3) a case from Bándora (Thána District) where a man, after quarrelling with his brother about some money matters, went to the bazár and on his return shut himself up in his room, where he was afterwards found dead. Opium was found in his viscera: (4) a case from Pandharpur (Sholápur District) and (5) a case from Málegaon (Násik District) in each of which opium was found in the viscera, no history being obtainable. In the remaining 6 cases, opium was detected in food or vomit but no fatal result is recorded. These cases were:—(6) A case from Dholka (Ahmedabad District) in which opium was found in the vomit of a man who was supposed to have taken dhatura: (7) a case from Nasirabad where opium was found in the contents of the stomach of a girl who appeared to be suffering from narcotic poisoning: (8) a case from Kaira in which a man tried to poison his aunt; opium was found in her food: (9) a case from Nándgaon (Násik District) in which a powder containing opium was found in possession of a "notorious character", no further history being recorded: (10) a case from Borsad (Kaira District) where a woman died after exhibiting symptoms of narcotism, opium being found in her food: (11) a case from Kárwár (Kánara District) in which a woman and four children after eating sweetmeat became narcotised but recovered after the administration of an emetic; opium was found in the food and also in the vomit.

18. *Dhatura.*—Five cases of poisoning with dhatura were examined during the year. These were:—(1) A case from Neemuch in which some seeds forwarded in connection with some murder case were identified as dhatura: (2) a case from Nasirabad; in this case a brown powder was found to contain an alkaloid which upon being administered to a dog produced the physiological effects of dhatura poisoning; no history of the case was obtainable: (3) a case from Pálanpur (Káthiáwár) in which two persons, after eating sweetmeat, became stupefied and vomited: some seeds forwarded were identified as dhatura, but no evidences of the poison were found in the vomit: (4) a case from Akola

(Berár) where the vomit of some person was found to contain an alkaloid producing the effects of dhatura: (5) a case from Paránti j (Ahmedabad District) in which food which produced symptoms of narcotism was found to contain dhatura. The food was stated to have produced narcotic effects in three men who partook of it.

19. *Strychnia.*—Four cases of strychnia-poisoning were examined during the year, three of which were forwarded by the Commissioner of Police, Bombay, at different times in connection with the same case. These were :—(1) in which the viscera of 5 persons, who died within a few hours of each other and who had all partaken of food together, were found to contain strychnia: (2) in which the viscera of a woman exhumed after four months of interment, were found to give the chemical reactions of strychnia: (3) a bottle of strychnia for identification. The above three cases were all in connection with the case known as the "Kambekar Street Murder," the history of which is briefly as follows :— One Bachoo, the son of a wealthy Memon, being in money difficulties and harassed by his creditors, repeatedly applied to his father for money, but not getting sufficient for his wants, he determined to put an end, not only to his father, but to all his relatives who stood in his way. With this intent he purchased some strychnia (taken from the bottle above referred to) and having taken the cook into his confidence, he promised him a sum of money if he would place the poison in the food of the five persons to whom reference has already been made. This the cook agreed to do and he accordingly placed the powder in the food. At different intervals after taking the food, the five people became convulsed and died the same night. The neighbours suspecting foul play, informed the police who stopped the funeral arrangements, and a *post-mortem* examination was performed, opinion being expressed that they had all died of "heart disease." The viscera as above stated were found to contain strychnia and the cook having turned "Queen's evidence," Buchoo was arrested and took his trial at the Sessions, where he was sentenced to death. The woman referred to in case No. 2 was also supposed to have been poisoned by Buchoo, who was her step-son, and her death was stated to have taken place somewhat suddenly after convulsions, as in the case of the other five persons poisoned: (4) a case from Junnar (Poona District) in which strychnia was detected in the viscera of a man who is stated to have been addicted to drink and to have committed suicide "because he had no more money to buy liquor."

20. *Aconitia.*—One case of poisoning by aconite was analysed. This was from Ahmedabad, in which aconitia was detected in a powder forwarded for examination. The powder was stated to have been given to a man in some sweetmeat, causing symptoms of aconite poisoning; none of the sweetmeat, however, was obtained for analysis.

21. *Chloroform.*—One case from Surat was examined in which this poison was used, but apparently not with homicidal intent, but to facilitate theft.

22. *Other Poisons.*—Two cases are included under this head : (1) a case from Sukkur (Sind), in which symptoms of irritant poisoning were observed in two men who had drunk the infusion of a plant forwarded for identification. The twigs and leaves were found to be those of Flueggia Leucopyrus, sometimes used as a fish poison: (2) a case from Saundatti (Belgaum District) in which a stick mounted with cotton wool, commonly known as an "abortion stick" and employed for purposes of criminal abortion, was forwarded for examination. The wool was found to contain an extract of Lal-chitrak (Plumbago rosea), commonly used as an abortifacient.

23. 76 cases of suspected attempt at human poisoning in which no poison could be detected, were forwarded for investigation during the past year. Of these 76 cases, 39 were cases in which the viscera of the deceased were forwarded for examination. These 39 cases may be thus classed :—

A.—Cases where death was probably due to disease or injury.

B.—Doubtful cases, where there was suspicion of poison, but with respect to which no information was obtained, either by *post-mortem* examination or analysis.

C.—Cases where the cause of death was unknown, but referred for confirmation as to the absence of poison. Of the 39 cases above referred to, 3 belong to Class A, 30 to Class B, and 6 to Class C. The 3 cases belonging to Class A include deaths probably due to the following diseases and injuries: 1 to hanging, 1 drowning and 1 hæmorrhage from cut throat. Of these 3 fatal cases the first two were men and the third a woman, all being apparently suicidal.

24. The 30 cases of Class B include all those in which, in the absence of symptoms of disease or of any distinctive *post-mortem* appearances accounting for death, suspicion had been directed to poison as the possible cause of death. These 30 cases include 35 deaths, of which 18 were men, 7 women and 10 children.

25. The 6 remaining cases classed under the head of C, were cases in which no suspicion of poison was entertained, but at the same time, no symptoms of disease were present. These were principally cases of sudden death, or of those where a corpse was found without any indication as to the cause of death. These 6 cases include 7 deaths, of which 3 were men, 3 women and 1 child. Hardly any information was afforded in any of those cases beyond the fact that the person was "found dead."

26. In 37 cases matters other than viscera were forwarded for examination in which no poison could be detected. In 15 of these, vomited matter was submitted for analysis; in 8 articles of food. In 3 cases, substances supposed to possess abortifacient properties were forwarded for examination. In another case, two stones, supposed to have fragments of dhatura seeds adhering to them, were sent for analysis. Five cases in which pills and powders were suspected to contain poison. Three cases in which organised animal tissue was forwarded for identification, and lastly, two cases in which liquids were forwarded for examination.

27. *Cases of suspected cattle poisoning.*—114 cases of this class were forwarded for investigation and report during the past year, this being slightly smaller than the corresponding number for last year. Of the 114 cases, poison was detected in 65, this figure being higher than in any previous year. As far as can be ascertained from the information supplied to this office, the 65 cases in which some poison was detected included the fatal poisoning of 73 animals, this being the largest number of fatal cases ever referred to this office for examination. Of these, 71 were horned cattle, 1 a dog and 1 a mare. The following table shows the corresponding numbers for the past five years:—

Year.	1887.	1888.	1889.	1890.	1891.
Number of cases referred	84	91	84	117	114
Number of detections	50	53	51	63	65
Animals killed.					
Ahmednagar	16	15	3	7	2
Belgaum	2	6	1	3	2
Bijápur	...	2	...	...	1
Khándesh	1	3	...	1	...
Násik	3	8	7	3	10
Poona	8	3	5	3	10
Sátára	...	8	7	11	23
Sholápur	9	3	18	14	5
Surat	2	...	7	3	1
Other Districts	16	15	9	13	19
Total Animals killed ...	57	63	57	58	73

28. In 15 of the cases in which poison was detected, more than one animal died from the effects of poison. One of these cases, in which five animals were killed, came from Sitara; in two cases from Tásgaon (Sátára District) and Indápur (Poona District) respectively four animals died. In two cases from Dhárwár and Sátára respectively three animals were killed and in each of the remaining 10 cases two animals died. These came from the following districts:—

Kaládgi, Násik, Poona and Sátára. Of the 73 cases in which poison was detected, in 13, the poison consisted of the seeds of Cerbera Thevetia (yellow oleander), in 1, of Lál Chitrak (Plumbago rosea), and in the remaining 59 cases, of arsenic, principally in the form of arsenious oxide or "white arsenic."

29. *Cases of suspected staining with blood, &c.*—56 cases were forwarded for examination and report during the year. Of these, 39 were cases of suspected staining with blood, and the remaining 17 were suspected of bearing stains of semen. The total number of articles examined in connection with both these classes was 193. Blood stains were found upon the articles forwarded in 37 out of the 39 cases above referred to, in 17 instances being found upon the articles of clothing only, and in 20 on weapons &c. Of the 37 cases in which blood was detected, 19 were apparently homicidal cases, and in the remainder no history was given.

30. Of the 17 cases of suspected seminal staining, in none was the existence of semen detected. In 9 cases of this class, blood stain was detected, but without any evidence of the presence of semen.

Section II.—Potable Waters.

31. During the past year 396 samples of water were forwarded to this office for examination and report respecting their suitability, or otherwise, for drinking purposes. This is more than half as many again than the corresponding number of waters analysed during the preceding year. The corresponding figures for the past five years are as follows:—

1887	207	1890	250
1888	280	1891	396
1889	260		

Of the 396 samples forwarded, 207 are classed as bad. The following table gives a summary of the results obtained:—

No.	Station.	Date of collection.	Source.	Grains per Gallon.		Parts per Million.		Sediment.	Column added by order of Government.	By whom sent, and Remarks.
				Total Solids.	Chlorine.	Ammonia. Free.	Ammonia. Albuminoid.			
1	Ahmedabad	April	Sábarmati River No. 1	29·40	5·11	..	·13	Scanty, conferva	Fair	2nd Assistant Collector.
2	Do.	Do.	Do. No. 2	30·10	5·53	..	·16	Do. diatoms	Bad	
3	Do.	Do.	Do. No. 3	33·60	5·22	·04	·20	Do. paramœcia	Do.	
4	Do.	Do.	Do. No. 4	34·30	5·46	·03	·18	Copious, do.	Do.	
5	Do.	Do.	Do. No. 5	28·00	5·25	·04	·20	Scanty, vegetable debris	Do.	
6	Do.	Do.	Do. No. 6	34·30	5·53	·04	·14	Do. do.	Do.	
7	Do.	Do.	Do. No. 7	31·50	5·39	·04	·29	Do. do.	Do.	
8	Do.	Do.	Do. No. 8	27·30	5·74	·05	·06	Do. do.	Do.	
9	Do.	Do.	Do. No. 9	74·20	5·11	1·12	·35	Copious, rotifers	Do.	Executive Engineer.
10	Do.	Do.	Do. No. 10	27·20	3·01	·25	·20	Do. do.	Do.	
11	Do.	Do.	Well, Central Jail	64·40	11·48	·16	·19	Scanty, conferva	Do.	
12	Do.	May	Well near Library	102·20	55·44	·02	·06	Do. vegetable debris	Do.	
13	Do.	July	Kutcha well	142·80	69·20	·04	·08	Do. do.	Do.	
14	Do.	Do.	Maharaja's Kund	219·80	91·35	·05	·32	Do. rotifers	Do.	Assistant Engineer, Public Works Department.
15	Do.	Do.	Well at Sokhal	102·10	50·63	·02	·13	Do. vegetable debris	Do.	
16	Do.	Do.	Well near Traveller's Bungalow.	53·90	14·56	·04	·10	Do. entomostraca	Do.	
17	Do.	Do.	Well near Kokta	261·80	109·90	·04	·14	Do. algæ and diatoms	Do.	
18	Do.	September	Well in Maharaja's garden	110·60	38·50	..	·09	Copious, vorticellæ	Do.	
19	Do.	Do.	New Railway well	47·60	7·77	·07	·05	Scanty, vegetable debris	Do.	
20	Do.	Do.	Gangasagar tank	8·40	0·62	·04	·20	Copious, paramœcia	Do.	
21	Do.	Do.	Dhoonia do.	13·40	0·91	·03	·32	Do. do.	Do.	
22	Do.	Do.	Goomadia do.	12·60	1·26	·05	·26	Do. do.	Do.	
23	Do.	Do.	Moonsar do.	30·80	8·47	·04	1·24	Scanty, amœbæ	Do.	
24	Do.	October	Vokia river, middle flood, 22nd July 1891.	39·90	14·21	..	·13	Copious, vegetable debris	Do.	
25	Do.	Do.	Do. highest flood, 23rd July 1891.	55·30	20·95	·04	·13	Do. do.	Do.	
26	Do.	Do.	Do. lowest flood, 24th July 1891.	57·40	21·98	·04	·17	Do. do.	Do.	
27	Do.	Do.	Do. highest flood, 25th July 1891.	11·90	2·22	..	·09	Do. do.	Fair	
28	Do.	Do.	Do. lowest flood, 27th July 1891.	8·30	2·29	·01	·09	Do. do.	Do.	Executive Engineer.
29	Do.	Do.	Do. middle flood, 28th July 1891.	7·70	2·01	..	·07	Do. do.	Do.	
30	Do.	Do.	Do. middle flood, 31st July 1891.	23·90	8·10	·01	·11	Do. do.	Bad	
31	Do.	Do.	Do. lowest flood, 2nd August 1891.	13·40	2·36	·01	·13	Do. do.	Fair	
32	Do.	Do.	Do. highest flood, 29th July 1891.	13·40	2·80	·01	·16	Do. do.	Bad	
33	Do.	Do.	Do. highest flood, 3rd August 1891.	9·10	1·61	·01	·08	Do. do.	Fair	
34	Do.	Do.	Do. middle flood, 5th August 1891.	402·20	189·30	·01	·17	Do. do.	Bad	
35	Do.	Do.	Do. lowest flood, 9th August 1891.	67·80	42·00	..	·13	Do. do.	Do.	

No.	Station.	Date of collection.	Source.	Grains per Gallon.		Parts per Million.		Sediment.	Column added by order of Government.	By whom sent, and Remarks.
				Total Solids.	Chlorine.	Ammonia.				
						Free.	Albuminoid.			
36	Ahmedabad	October	Stand-post outside Delhi gate.	9·10	3·08	..	·02	Scanty, rotifers	Good ..	Secretary, Municipality.
37	Do.	November	Well sunk in Futa Talao ..	62·30	2·43	·94	·35	Copious, monads	Bad ..	Executive Engineer.
38	Do.	December	New Railway well	43·50	7·35	·02	·28	Scanty, vegetable debris ..	Do. ..	Superintendent of Jail.
39	Ahmednagar	August	Market A	24·50	1·19	·01	·11	Copious, paramœcia	Do. ..	
40	Do.	Do.	Do. B	24·50	0·77	·04	·09	Do. do.	Fair ..	
41	Do.	December	Private well	57·40	2·52	·15	·14	Scanty, vegetable debris ..	Bad ..	Executive Engineer.
42	Do.	Do.	Do. do.	27·30	1·40	·13	·13	Do. do. ..	Do. ..	
43	Do.	Do.	Municipal well	60·30	2·38	·11	·06	Do. paramœcia	Do. ..	
44	Ajmere	June ..	Noorbuxsha Bavri ..	22·40	1·54	·03	·05	Scanty, nematoda	Fair ..	
45	Do.	Do.	Lead mines	20·10	2·38	·03	·05	Do. paramœcia	Do. ..	
46	Do.	Do.	Shoregaran well	49·00	4·76	·04	·06	Do. rotifers	Bad ..	
47	Do.	Do.	Chand Bavri	75·60	14·56	·40	·14	Do. vegetable debris ..	Do. ..	
48	Do.	Do.	Katan Bavri	37·80	2·38	·04	·10	Do. paramœcia	Fair ..	
49	Do.	Do.	New well, Doulat Bág ..	68·00	20·30	·04	·09	Do. do.	Bad ..	
50	Do.	Do.	Jhalas in Dargá	45·40	5·60	·01	·10	Do. rotifers	Do. ..	
51	Do.	Do.	Mir Shah Ali's garden well ..	39·20	3·22	·12	·05	Do. paramœcia	Do. ..	Assistant Engineer.
52	Do.	Do.	Dondhia well	112·80	27·72	·06	·09	Do. vegetable debris ..	Do. ..	
53	Do.	Do.	Shukar well	167·30	33·60	..	·05	Do. do.	Do. ..	
54	Do.	Do.	Anasagar lake	58·80	16·38	·08	·80	Do. do.	Do. ..	
55	Do.	Do.	City stand-post	53·90	12·46	·04	·36	Do. do.	Do. ..	
56	Do.	Do.	New Jail well	29·40	2·66	·03	·07	Do. paramœcia	Fair ..	
57	Do.	Do.	Shambhoosan's well ..	155·30	32·90	·06	·25	Do. vegetable debris ..	Bad ..	
58	Do.	Do.	Raman's Baghthi well ..	37·80	11·16	·03	·05	Do. nematoda	Do. ..	
59	Do.	Do.	Bhatiara well	49·00	6·02	·05	·04	Do. paramœcia	Do. ..	
60	Do.	August	Mr. James' well	178·50	57·40	·21	·16	Copious, nematoda	Do. ..	Executive Engineer.
61	Do.	September	Bandi Nadi	42·70	3·08	·08	·12	Do. vegetable debris ..	Do. ..	Assistant Engineer.
62	Do.	Do.	Well near bridge	18·20	2·52	·04	·07	Do. paramœcia	Fair ..	
63	Do.	Do.	Well in Residency compound.	14·70	2·24	·16	·06	Do. rotifers	Bad ..	Executive Engineer.
64	Do.	Do.	Well near Cricket ground ..	15·40	2·87	·07	·07	Do. vegetable debris ..	Fair ..	
65	Do.	Do.	Well opposite Surgeon-Major Spencer's bungalow.	12·60	2·38	·40	·19	Do. amœbæ and rotifers	Bad ..	
66	Babhaleshwar	May ..	Well, Babhaleshwar	42·00	9·19	·01	·04	Do. vegetable debris ..	Do. ..	
67	Do.	Do.	Step well do.	39·20	4·06	·03	·04	Do. do.	Fair ..	Deputy Sanitary Commissioner, Central Registration District.
68	Do.	Do.	Well to the west, do. ..	39·20	4·97	·07	·03	Do. do.	Do. ..	
69	Do.	Do.	Well to the east, do. ..	35·00	4·83	·05	·04	Do. paramœcia	Do. ..	
70	Bágewádi	Do.	Bágewádi	30·40	2·72	·04	·06	Copious, vegetable debris ..	Do. ..	2nd Assistant Collector.
71	Belgaum	February	Pathi Karanji of Hukeri ..	27·30	1·82	·01	·05	Scanty, confervæ and diatoms.	Good ..	District Deputy Collector.
72	Do.	Do.	Mosali Karanji	7·00	1·54	·01	·05	Do. paramœcia	Do. ..	
73	Do.	Do.	Well	24·50	2·17	·01	·09	Do. vegetable debris ..	Fair ..	
74	Do.	Do.	Kallapa's well	39·20	7·91	..	·20	Do. paramœcia	Bad ..	
75	Do.	Do.	Masonry tank	10·50	1·26	·04	·23	Do. vegetable debris ..	Do. ..	1st Assistant Collector.
76	Do.	March	Tank at Mosgoodkhan ..	15·10	·91	·05	·53	Copious, paramœcia	Do. ..	
77	Do.	Do.	Nala at Kokatnur	25·90	4·09	·05	·12	Scanty, do.	Do. ..	District Deputy Collector.
78	Do.	Do.	Well at Kittur	184·80	44·52	·05	·13	Do. vegetable debris ..	Do. ..	
79	Do.	Do.	Tank at Degaon	16·80	2·24	·07	·08	Copious do. ..	Fair ..	1st Assistant Collector.
80	Do.	Do.	Do. Athni	12·60	1·12	..	·20	Do. do. ..	Bad ..	
81	Do.	Do.	Kambhar well	43·40	3·99	·04	·07	Scanty, do. ..	Fair ..	District Deputy Collector.
82	Do.	May ..	Well at Sanmatti	21·00	2·24	·01	·03	Do. paramœcia	Good ..	1st Assistant Collector.
83	Do.	Do.	Mandapur	35·00	7·35	·03	·07	Copious, vegetable debris ..	Fair ..	
84	Do.	Do.	Konnur	17·50	1·82	·03	·08	Scanty, do. ..	Do. ..	2nd Assistant Collector.
85	Do.	Do.	Sigihitti	22·40	4·35	·03	·10	Copious, do. ..	Do. ..	
86	Do.	Do.	Arbhavi Wanaihatti ..	26·60	2·73	·03	·06	Do. do. ..	Do. ..	
87	Do.	June ..	Source not mentioned ..	18·90	2·59	1·07	·24	Scanty, do. ..	Bad ..	District Superintendent of Police.
88	Do.	July ..	Sunar well	28·00	1·68	·01	·05	Do. do. ..	Fair ..	District Deputy Collector.
89	Bijápur	October	Begum Tank	174·30	33·04	..	·06	Do. do. ..	Bad ..	
90	Do.	Do.	Sunar Bavdi	66·50	4·20	·02	·09	Do. do. ..	Do. ..	
91	Do.	December	Torri pipe	30·10	2·14	·04	·03	Do. paramœcia	Good ..	Executive Engineer.
92	Do.	Do.	Do.	29·40	2·80	..	·04	Do. do.	Do. ..	
93	Do.	Do.	Do.	56·00	7·28	·01	·08	Copious, vegetable debris ..	Bad ..	
94	Do.	Do.	Do.	52·50	6·86	..	·03	Do rotifers	Do. ..	
95	Do.	Do.	Do.	14·70	3·57	·03	·05	Scanty, paramœcia	Good ..	
96	Do.	Do.	Do.	55·30	7·42	·01	·03	Do. do.	Bad ..	
97	Do.	Do.	Begum Tank	14·00	9·70	·01	·16	Do. vegetable debris ..	Do. ..	Executive Engineer.
98	Do.	Do.	Do.	51·80	8·26	·01	·11	Do. do. ..	Do. ..	
99	Do.	Do.	Do.	79·10	8·68	..	·07	Do. do. ..	Do. ..	
100	Do.	Do.	Gunj	53·20	7·77	..	·10	Do. do. ..	Do. ..	
101	Bombay	April ..	Well water	312·50	69·39	·04	·17	Do. do. ..	Do. ..	Mr. Hargrave.
102	Do.	July ..	Well A before cleaning ..	29·40	4·06	·04	·21	Do. vorticellæ	Do. ..	
103	Do.	Do.	Do. A after cleaning ..	15·90	13·65	..	·08	Do. rotifers	Do. ..	Health Officer of the Port.
104	Do.	Do.	Do. C before cleaning ..	47·60	1·89	·08	·68	Do. paramœcia	Do. ..	
105	Do.	Do.	Do. C after cleaning ..	24·50	1·68	·03	·10	Do. vegetable debris ..	Fair ..	
106	Do.	September	North flank of barracks ..	7·70	1·05	·07	·09	Copious, amœbæ and rotifers.	Do. ..	President, Colába Board of Health.
107	Do.	Do.	South flank of do. ..	5·60	0·98	·04	·10	Do. paramœcia	Do. ..	
108	Do.	Do.	Well No. 15, Parsi Bazar ..	25·70	6·58	·01	·04	Do. do.	Do. ..	
109	Do.	October	Veterinary College, Well No. 1	53·90	9·40	·07	·05	Scanty, monads	Bad ..	Principal, Veterinary College.
110	Do.	Do.	Do. No. 2 ..	21·00	2·80	·05	·04	Do. do.	Fair ..	
111	Do.	Do.	Do. No. 3 ..	15·40	2·10	·05	·09	Do. do.	Do. ..	
112	Do.	Do.	Market No. 8	39·20	1·89	..	·03	Copious, vegetable debris ..	Do. ..	Executive Engineer.
113	Do.	Do.	Do. No. 19	48·30	2·10	·01	·06	Do. monads	Bad ..	
114	Do.	November	Well at Firpao	29·40	2·38	..	·11	Scanty, rotifers	Fair ..	Health Officer of the Port.
115	Do.	Do.	Do.	18·20	2·24	·03	·12	Do. vegetable debris ..	Do. ..	
116	Broach	February	No. 1	88·20	18·06	..	·09	Do. paramœcia	Bad ..	
117	Do.	Do.	.. 2	31·50	6·65	..	·09	Do. monads	Fair ..	
118	Do.	Do.	.. 3	46·60	14·21	..	·08	Copious do. ..	Bad ..	Executive Engineer.
119	Do.	Do.	.. 4	22·40	2·10	..	·07	Scanty, paramœcia	Good ..	
120	Do.	Do.	.. 5	651·00	175·00	·03	·11	Do. vegetable debris ..	Bad ..	
121	Do.	Do.	.. 6	409·50	150·40	·27	·20	Do. paramœcia	Do. ..	
122	Do.	May ..	.. 7	28·00	3·57	·04	·06	Copious, vegetable debris ..	Fair ..	
123	Do.	Do.	.. 8	31·50	3·50	·01	·05	Do. do. ..	Do. ..	
124	Do.	Do.	.. 9	28·00	2·41	·01	·05	Do. do. ..	Do. ..	
125	Do.	Do.	.. 10	23·10	4·27	·01	·05	Do. do. ..	Do. ..	
126	Do.	Do.	.. 11	344·60	112·00	·04	·09	Scanty do. ..	Bad ..	
127	Do.	Do.	.. 12	42·70	4·62	·03	·05	Copious do. ..	Fair ..	Sub-Engineer, Public Works Department.
128	Do.	Do.	.. 13	21·70	4·06	·01	·05	Do. do. ..	Do. ..	
129	Do.	Do.	.. 14	22·40	3·57	·01	·07	Do. do. ..	Do. ..	
130	Do.	Do.	.. 15	95·20	37·08	·01	·10	Do. do. ..	Bad ..	
131	Do.	Do.	.. 16	67·20	12·82	·01	·03	Do. do. ..	Do. ..	
132	Do.	Do.	.. 17	19·60	2·72	·01	·06	Do. do. ..	Fair ..	
133	Do.	Do.	.. 18	21·70	3·22	·01	·08	Do. do. ..	Do. ..	

No.	Station.	Date of collection.	Source.	Grains per Gallon.		Parts per Million.		Sediment.	Column added by order of Government.	By whom sent, and Remarks.
				Total Solids.	Chlorine.	Ammonia.				
						Free.	Albuminoid.			
134	Broach	May	No. 19	29·30	4·41	·03	·07	Scanty, vegetable debris	Fair	
135	Do.	Do.	„ 20	47·60	19·04	·02	·05	Do. paramœcia	Bad	
136	Do.	Do.	„ 21	686·70	35·90	·04	·10	Do. do.	Do.	
137	Do.	Do.	„ 22	21·70	1·96	·04	·06	Do. vegetable debris	Fair	
138	Do.	Do.	„ 23	42·70	6·96	·04	·08	Do. do.	Bad	
139	Do.	Do.	„ 24	495·60	165·80	·04	·05	Do. do.	Do.	Sub-Engineer, Public Works Department.
140	Do.	Do.	„ 25	93·10	18·48	·04	·04	Do. do.	Do.	
141	Do.	Do.	„ 26	736·40	142·80	·01	·04	Do. do.	Do.	
142	Do.	Do.	„ 27	606·20	117·00	·04	·09	Do. do.	Do.	
143	Do.	Do.	„ 28	30·40	6·11	·04	·04	Do. do.	Fair	
144	Do.	July	„ 29	50·80	3·04	·01	·09	Do. do.	Bad	
145	Do.	Do.	„ 30	19·00	2·73	·01	·03	Do. paramœcia	Fair	
146	Do.	Do.	„ 31	81·20	15·82	·01	·03	Do. vegetable debris	Bad	Supervisor, Public Works Department.
147	Do.	Do.	„ 32	80·60	21·00	·04	·04	Do. paramœcia	Do.	
148	Do.	Do.	„ 33	117·60	49·01	..	·03	Scanty, vegetable debris	Do.	
149	Do.	Do.	„ 34	33·60	6·16	..	·04	Do. do.	Fair	
150	Do.	Do.	„ 35	60·80	31·49	·04	·03	Do. do.	Bad	
151	Dákor	June	Lanaria Kuva	22·20	3·37	·04	·07	Do. paramœcia	Fair	Hospital Assistant.
152	Do.	Do.	Khajooria Kuva	44·10	5·22	·27	·09	Do. vegetable debris	Bad	Chief Commissariat Officer.
153	Deesa	March	Well	33·60	4·48	·16	·17	Copious do.	Do.	Do. do.
154	Do.	July	Do.	34·30	3·73	·01	·01	Scanty do.	Fair	
155	Dhandhuka	August	Well used by the inhabitants of Khas.	50·40	9·30	·04	·17	Do. paramœcia	Bad	Mámlatdár.
156	Do.	Do.	Do. by the inhabitants of Bagad.	36·40	3·78	..	·28	Do. do.	Do.	
157	Dhárwár	March	Bison Lodge	5·60	·77	·04	·06	Do. vegetable debris	Good	Resident Engineer.
158	Do.	September	Dyloking Water	64·10	6·60	·04	·04	Copious, paramœcia	Fair	Medical Officer, Deccan Convict Gang.
159	Do.	Do.	Garden well	26·40	5·60	·01	·08	Do. do.	Do.	
160	Do.	Do.	Ambral do.	40·00	4·48	·06	·46	Do. confervæ	Bad	
161	Do.	December	Keigeri tank	11·20	3·36	·15	·38	Do. rotifers	Do.	Executive Engineer.
162	Do.	Do.	Do. nála	37·10	7·98	·04	·08	Scanty, paramœcia	Do.	
163	Do.	Do.	Chik Malligad nala	43·40	11·48	·03	·03	Do. do.	Do.	
164	Dohad	June	Sakur Kuva	152·60	29·40	·03	·09	Copious, vegetable debris	Bad	
165	Do.	Do.	Bhura Kuva	64·40	11·06	·03	·09	Do. do.	Do.	
166	Do.	Do.	Bamajika Motha Kuva	45·50	7·28	·04	·14	Do. monads	Do.	
167	Do.	Do.	Do. Nanla do.	113·40	23·24	·04	·12	Do. vegetable debris	Do.	
168	Do.	Do.	Tank	25·90	3·50	1·21	1·29	Scanty, monads	Do.	
169	Do.	Do.	Line Kuva	43·40	4·61	·03	·06	Copious, ferric oxide	Fair	
170	Do.	Do.	Nadeenee Zaree	58·10	12·04	·08	·12	Do. do.	Bad	Assistant Surgeon.
171	Do.	Do.	Bomajino Kuva	74·00	14·00	·01	·09	Do. do.	Do.	
172	Do.	Do.	Municipality Kuva	79·80	12·38	·04	·06	Do. do.	Do.	
173	Do.	Do.	Anandeshai Kuva	32·00	3·22	·01	·03	Do. do.	Fair	
174	Do.	Do.	Jail Kuva	102·80	12·00	·01	·01	Do. do.	Bad	
175	Do.	Do.	Khara Kuva	74·20	17·36	·01	·06	Do. do.	Do.	
176	Do.	Do.	Talao Najika Kuva	46·20	7·70	·01	·10	Scanty, paramœcia	Do.	Superintendent of Jail.
177	Godhra	November	Well in Jail compound	27·30	2·73	1·40	·20	Copious, vegetable debris	Do.	
178	Gokak	July	Shigiholi	9·80	1·82	·08	·20	Do. do.	Do.	Mámlatdár.
179	Do.	Do.	Mandapur	37·10	7·40	·04	·14	Do. do.	Do.	
180	Do.	Do.	Arbhanl-Wanalhatti	28·00	3·78	3·84	·52	Scanty, paramœcia	Do.	
181	Do.	Do.	Koonur	18·90	1·82	·01	·18	Do. do.	Do.	Hospital Assistant.
182	Hathyal	Do.	Tank	9·80	·63	2·52	·67	Do. vegetable debris	Do.	Executive Engineer.
183	Indore	April	Rajgurh well	35·00	1·96	·04	·09	Do. paramœcia	Fair	
184	Jubulpore	February	Public fountain	1·40	·42	·01	·12	Do. vegetable debris	Bad	Do. do.
185	Do.	Do.	Reservoir	1·40	·35	·01	·09	Do. do.	Fair	
186	Do.	Do.	Private	2·10	·42	·04	·12	Do. do.	Bad	
187	Kamptí	March	Well	91·70	12·95	..	·14	....	Do.	Administrative Medical Officer.
188	Khanagaon	July	Tank	17·50	·84	·03	·19	Scanty, vegetable debris	Bad	Chairman, Municipality.
189	Do.	October	Cistern water	11·20	·49	..	·11	Do. do.	Fair	Do. do.
190	Do.	Do.	Tank water	14·70	·49	·16	·17	Do. rotifers	Bad	Executive Engineer.
191	Khándesh	February	Wedargaon Nála	19·60	2·24	·04	·18	Do. paramœcia	Do.	Do. do.
192	Do.	March	Do.	29·40	3·73	·03	·14	Do. vegetable debris	Do.	Do. do.
193	Do.	April	Do.	21·00	2·45	·06	·13	Do. paramœcia	Do.	
194	Do.	June	No. 1 from a spring	25·00	2·94	·01	·09	Do. do.	Fair	
195	Do.	Do.	No. 2 from a well	28·00	2·31	·01	·07	Do. vegetable debris	Do.	
196	Do.	Do.	Spring	30·80	1·96	·05	·06	Do. do.	Do.	Executive Engineer.
197	Do.	Do.	Well	30·10	2·73	·01	·02	Do. do.	Do.	
198	Do.	July	Well No. 1	11·20	2·80	·04	·08	Do. vegetable debris	Fair	
199	Do.	Do.	Do. No. 2	30·80	2·80	·07	·13	Do. do.	Bad	
200	Do.	August	Wedargaon Nála	15·40	·98	·03	·14	Do. paramœcia	Do.	
201	Málegaon	November	Well No. 8 near Church	23·80	1·19	..	·09	Do. do.	Fair	
202	Do.	Do.	Mr. Sorabji's well	30·80	2·92	·06	·09	Do. vegetable debris	Do.	
203	Do.	Do.	Well No. 5 in Budhwar Bazar.	22·40	1·54	..	·18	Do. rotifers	Bad	Senior Hospital Assistant Staff and details.
204	Do.	Do.	Well in Arsenal guard	26·10	1·23	·07	·08	Do. paramœcia	Fair	
205	Do.	Do.	Well near Police Line	30·80	1·05	..	·06	Do. vegetable debris	Do.	
206	Do.	Do.	Well in Maruti's Temple	30·80	1·61	·01	·05	Do. monads	Do.	
207	Do.	Do.	Well No. 2 near Foot Artillery Hospital.	24·50	1·26	..	·08	Do. rotifers	Do.	
208	Mhow	May	Reservoir	10·50	·70	·04	·24	Do. confervæ	Bad	Medical Officer, Station Hospital.
209	Do.	July	Do.	15·40	·70	·07	·16	Do. paramœcia	Do.	
210	Do.	September	Nurchasma well	20·30	1·54	·15	·24	Copious, paramœcia	Do.	
211	Do.	Do.	Doodla well	107·10	33·25	1·28	·32	Do. do.	Do.	
212	Nágpur	July	Ambagheri reservoir	14·00	·28	·08	·16	Scanty, paramœcia	Do.	
213	Do.	Do.	Drinking stand	11·90	·42	·03	·12	Do. do.	Do.	Executive Engineer.
214	Do.	Do.	Private tap	8·40	·42	·01	·10	Do. do.	Fair	
215	Do.	December	Ambagheri reservoir	7·70	·35	·04	·10	Do. rotifers	Do.	
216	Do.	Do.	Public drinking fountain	10·50	·35	·06	·06	Do. monads	Do.	
217	Do.	Do.	Private tap in the City	4·90	·35	·06	·07	Do. paramœcia	Do.	
218	Nasirabad	May	Well No. 1	58·80	14·07	·03	·04	Do. monads	Bad	Cantonment Magistrate.
219	Do.	Do.	Do. No. 2	60·80	10·24	·12	·06	Do. do.	Do.	
220	Do.	Do.	Do. No. 3	62·30	16·80	·04	·04	Do. do.	Do.	
221	Do.	Do.	Do. No. 4	32·20	4·27	·03	·06	Do. do.	Fair	
222	Do.	October	Market 1	66·50	17·64	·02	·05	Do. paramœcia	Bad	Medical Officer, 19th Bombay Infantry.
223	Do.	Do.	Do. 2	72·10	14·98	·05	·17	Do. monads	Do.	
224	Do.	Do.	Do. 3	116·20	48·65	·16	·06	Do. do.	Do.	
225	Do.	Do.	Do. 4	220·40	50·40	·12	·08	Do. vegetable debris	Do.	Political Superintendent.
226	Pálanpur	February	Tank, Ranisar	51·10	20·30	·09	·53	Copious, do.	Do.	
227	Párola	March	Well, Rhamad	31·50	2·31	·01	·08	Scanty, do.	Fair	Chairman, Municipality.
228	Do.	Do.	Well, Purushi Vihir	16·10	6·84	·01	·03	Do. do.	Good	
229	Do.	Do.	Well, Shewanbai Chand	21·35	1·40	..	·04	Do. do.	Do.	
230	Patan	December	Patan tank near Surat	6·35	·28	·01	·28	Do. paramœcia	Bad	Deputy Sanitary Commissioner.
231	Do.	Do.	Pul below Patan tank	25·20	1·49	·01	·11	Do. do.	Fair	
232	Do.	Do.	Patan tank near tank	8·40	·28	·03	·26	Do. rotifers	Bad	
233	Poona	January	Discense tank	8·40	·42	..	·05	Do. vegetable debris	Good	Executive Engineer.
234	Do.	Do.	Canal water	4·20	·56	·04	·06	Do. do.	Do.	
235	Do.	March	Dispense tank	3·50	·56	·04	·04	Do. confervæ	Do.	
236	Do.	Do.	Canal water	4·20	·56	·01	·08	Do. do.	Do.	

No.	Station.	Date of collection.	Source.	Grains per Gallon.		Parts per Million.		Sediment.	Column added by order of Government.	By whom sent, and Remarks.
				Total Solids.	Chlorine.	Ammonia. Free.	Ammonia. Albuminoid.			
227	Poona	May	Spring No. 4	7·00	·56	·03	·03	Scanty, vegetable debris	Good	J. E. Whiting, Engineer.
238	Do.	June	Canal water	4·20	·56	·01	·06	Do. do.	Fair	Executive Engineer.
239	Do.	Do.	Dispense tank	4·20	·56	·03	·05	Do. do.	Do.	
240	Do.	Do.	(Source not stated)	23·10	5·88	..	..	....	..	Resident Engineer, S. M. Railway.
241	Do.	Do.	Tank No. 5	9·10	·49	·03	·09	Scanty, monads	Fair	Executive Engineer.
242	Do.	Do.	Do. No. 6	8·40	·49	..	·09	Do. do.	Do.	
243	Do.	July	Canal water	5·60	·49	·03	·10	Do. confervæ	Do.	
244	Do.	Do.	Dispense tank	5·60	·49	·03	·10	Do. paramecia	Do.	
245	Do.	August	Canal water	7·70	·49	..	·07	Do. confervæ	Do.	
246	Do.	Do.	Dispense tank	7·70	·49	·04	·09	Do. do.	Do.	
247	Do.	September	Settling tank	7·00	·63	·04	·32	Copious, paramecia	Bad	
248	Do.	Do.	Dispense tank No. 2	7·00	·63	·04	·06	Do. do.	Fair	
249	Do.	Do.	Do. No. 3	2·10	·56	·05	·04	Do. do.	Do.	
250	Do.	Do.	Market No. 1	7·00	·56	·01	·00	Scanty, vegetable debris	Good	Deputy Sanitary Commissioner, C. R. D.
251	Do.	Do.	Do. No. 2	7·00	·49	·01	·02	Do. do.	Do.	
252	Do.	Do.	Station Hospital	6·30	·49	..	·01	Do. do.	Do.	
253	Do.	Do.	Western India Club	7·00	·56	..	·03	Do. do.	Do.	
254	Do.	Do.	Sassoon Hospital	7·00	·49	·01	·01	Do. do.	Do.	
255	Do.	October	Soda water	25·90	3·15	·04	·11	Do. do.	Fair	Medical Officer, Station Hospital.
256	Do.	Do.	Settling tank No. 2	7·00	·14	·01	·02	Do. monads	Good	Executive Engineer.
257	Do.	Do.	Dispense tank No. 2	7·70	·21	..	·02	Do. confervæ	Do.	
258	Do.	Do.	Do. No. 1	5·60	·14	..	·02	Do. do.	Do.	
259	Do.	November	Canal water	6·30	·70	..	·04	Do. vegetable debris	Do.	
260	Do.	Do.	Settling tank	7·70	·84	·01	·04	Do. do.	Do.	
261	Do.	Do.	Do.	7·00	·77	..	·04	Do. do.	Do.	
262	Do.	December	Soda water	36·40	4·48	..	·09	Do. do.	Fair	Chief Commissariat Officer.
263	Do.	Do.	Water	4·20	·49	·01	·05	Do. do.	Do.	
264	Do.	Do.	Do.	23·10	4·27	..	·06	Do. rotifers	Do.	
265	Do.	Do.	Do.	7·70	·91	·03	·06	Do. paramecia	Do.	
266	Do.	Do.	Do.	21·00	1·33	·03	·07	Do. vegetable debris	Do.	
267	Porbandar	July	Bhojeshwar bungalow well	32·90	6·30	·04	·05	Do. do.	Do.	State Engineer.
268	Do.	Do.	Jubilee well	45·50	7·98	..	·03	Do. do.	Bad	
269	Do.	Do.	Lal bungalow well	47·60	16·10	·03	·04	Do. do.	Do.	
270	Do.	Do.	Maharaja's well	44·80	10·22	..	·04	Do. do.	Do.	
271	Do.	Do.	Rajwadi well	57·40	12·60	·01	·05	Do. do.	Do.	Medical Officer, Station Hospital.
272	Do.	Do.	Tank on top of hill	9·10	·49	·01	·08	Do. paramecia	Fair	
273	Do.	December	Do.	8·40	·63	·04	·17	Do. vegetable debris	Bad	
274	Rájkot	January	Well No. 1, station Lilapore	84·70	25·06	1·07	·20	Do. rotifers and nematoda.	Do.	Station Staff Officer.
275	Do.	Do.	Well No. 2 do.	61·60	19·76	..	·08	Do. do.	Do.	
276	Do.	Do.	Well No. 1, station Bapudra	23·10	2·10	·07	·14	Do. paramecia	Do.	
277	Do.	Do.	Well No. 2, do.	68·60	20·30	·03	·15	Do. do. and rotifers.	Do.	
278	Do.	May	Sarpda river, still water	22·40	4·20	·04	·10	Do. diatoms	Fair	Medical Officer, 24th Regiment, Bombay Infantry.
279	Do.	Do.	Do. running water.	22·40	4·06	·03	·10	Do. do.	Do.	
280	Rájpipla	July	Boring	79·10	12·46	·16	·19	Copious, vegetable debris	Bad	Chief Medical Officer.
281	Ratnágiri	September	Rajenda well	7·00	2·24	..	·04	Scanty, do.	Fair	Chairman, Municipality.
282	Sampgaon	October	Sakrikeri tank	17·50	1·40	·48	·82	Do. algæ	Bad	Mámlatdár.
283	Sángli	November	Kakadmadi springs	39·20	8·12	·09	·05	Do. monads	Fair	Chief Medical Officer.
284	Saundatti	July	Annappaganda's houd	3·50	·77	·03	·03	Do. rotifers	Good	Vice-President, Municipality.
285	Do.	Do.	Bhorasah Nála	6·30	1·47	·03	·40	Do. do.	Bad	
286	Do.	Do.	Madanabhani well	7·00	2·38	·04	·30	Do. algæ	Do.	
287	Do.	Do.	Pattarbhhani well	34·30	5·88	·04	·56	Do. do.	Do.	
288	Shikárpur	June	Well at Mardi	28·00	1·47	6·67	1·16	Copious, paramecia	Do.	Civil Surgeon.
289	Do.	Do.	Sandutkhan well	51·80	5·88	·03	·05	Do. do.	Do.	
290	Do.	Do.	Jumakhan well	54·60	8·26	·01	·05	Do. rotifers	Do.	
291	Do.	Do.	Jaffar Shah well	49·00	6·30	·01	·04	Do. vegetable debris	Do.	
292	Do.	Do.	Gajikori well	51·80	7·00	..	·03	Do. rotifers	Do.	
293	Do.	Do.	Hukeyjah well	66·50	17·78	1·39	·35	Copious, algæ	Do.	Municipal Secretary.
294	Do.	Do.	Molla Mattar	37·10	4·41	1·07	·16	Scanty, monads	Do.	
295	Do.	Do.	Panj Pir well	44·80	7·14	·04	·06	Do. do.	Do.	
296	Do.	Do.	Mouji's well	37·10	3·71	·04	·13	Do. do.	Do.	
297	Do.	Do.	Wadlu Market	47·60	7·77	·04	·08	Do. vegetable debris	Do.	
298	Do.	Do.	Gyan Chawl well	48·30	7·14	·04	·06	Do. do.	Do.	
299	Do.	Do.	Ismailshah well	49·00	5·18	·03	·03	Do. do.	Do.	
300	Do.	Do.	Pirkhan Chaudri	44·80	7·63	..	·10	Do. do.	Do.	
301	Sholápur	August	Well at Mardi	28·00	1·47	6·67	1·16	Copious, paramecia	Do.	Civil Surgeon.
302	Surat	January	Taptee River No. 1	25·20	2·17	·01	·17	Scanty, vegetable debris	Do.	Executive Engineer.
303	Do.	Do.	Do. do. No. 2	19·60	2·17	·01	·06	Do. do.	Fair	
304	Do.	Do.	Do. do. No. 3	22·40	2·17	..	·09	Do. do.	Do.	
305	Do.	Do.	Do. do. No. 4	16·80	2·03	·12	·11	Do. do.	Bad	
306	Do.	Do.	Do. do. No. 5	25·90	2·73	·03	·08	Do. algæ and monads	Fair	
307	Do.	Do.	Do. do. No. 6	25·90	2·66	·03	·07	Do. do.	Do.	
308	Do.	February	Jail well	252·70	113·40	·04	·09	Do. vegetable debris	Bad	Superintendent of Jail.
309	Do.	Do.	Do. No. 7	23·80	2·73	·04	·06	Do. do.	Fair	
310	Do.	Do.	Do. No. 8	21·00	2·73	·01	·08	Do. do.	Do.	
311	Do.	March	Do. No. 9	21·70	2·73	·01	·05	Do. vorticellæ	Do.	
312	Do.	Do.	Do. No. 10	22·40	2·87	·01	·06	Do. monads	Do.	
313	Do.	Do.	Do. No. 11	18·90	3·15	·04	·08	Do. vegetable debris	Do.	
314	Do.	Do.	Do. No. 12	22·10	3·01	·01	·09	Do. paramecia	Do.	
315	Do.	Do.	Do. No. 13	21·70	3·08	·04	·17	Do. diatoms	Bad	
316	Do.	Do.	Do. No. 14	23·80	3·08	·01	·09	Do. do.	Fair	
317	Do.	May	Do. No. 15	29·39	3·08	·01	·11	Do. do.	Bad	
318	Do.	Do.	Do. No. 16	21·00	3·50	·03	·08	Do. do.	Fair	
319	Do.	Do.	Do. No. 17	20·30	3·43	·01	·07	Do. do.	Do.	
320	Do.	Do.	Do. No. 18	27·30	3·36	·12	·10	Do. do.	Bad	
321	Do.	Do.	Do. No. 19	27·30	3·43	·08	·12	Do. do.	Do.	
322	Do.	Do.	Do. No. 20	32·90	3·64	·04	·07	Do. do.	Fair	
323	Do.	Do.	Do. No. 21	32·20	3·50	·07	·08	Do. vegetable debris	Do.	
324	Do.	Do.	Do. No. 22	23·80	3·85	·03	·06	Do. do.	Do.	
325	Do.	Do.	Do. No. 23	25·20	3·78	·01	·07	Do. monads	Do.	
326	Do.	Do.	Do. No. 24	25·20	3·78	·01	·05	Do. vegetable debris	Do.	
327	Do.	Do.	Do. No. 25	25·90	3·78	·01	·06	Do. do.	Do.	
328	Do.	Do.	Do. No. 26	31·50	3·85	..	·04	Do. do.	Do.	
329	Do.	Do.	Do. No. 27	29·40	4·34	·01	·10	Do. nematoda	Bad	
330	Do.	Do.	Do. No. 28	28·00	4·34	·04	·06	Do. diatoms	Fair	
331	Do.	Do.	Do. No. 29	29·40	4·13	·05	·08	Do. paramecia	Do.	
332	Do.	Do.	Do. No. 30	32·20	4·13	·01	·06	Do. diatoms	Do.	
333	Do.	July	Do. No. 31	30·80	4·13	..	·08	Do. vegetable debris	Do.	
334	Do.	Do.	Do. No. 32	25·20	4·34	..	·07	Do. do.	Do.	
335	Do.	Do.	Do. No. 33	29·40	4·41	..	·05	Do. do.	Do.	
336	Do.	Do.	Do. No. 34	31·50	4·41	·03	·14	Do. do.	Do.	
337	Do.	Do.	Do. No. 35	32·90	4·41	·03	·09	Do. do.	Bad	
338	Do.	Do.	Do. No. 36	23·10	1·75	·01	·04	Do. do.	Fair	
339	Do.	Do.	Do. No. 37	29·40	3·92	·03	·09	Do. do.	Do.	
340	Do.	Do.	Do. No. 38	9·10	·84	..	·05	Do. do.	Do.	
341	Do.	Do.	Do. No. 39	7·00	·77	·04	·06	Do. do.	Good	
									Fair	

No.	Station.	Date of collection.	Source.	Grains per Gallon.		Parts per Million.		Sediment.	Column added by order of Government.	By whom sent, and Remarks.
				Total Solids.	Chlorine.	Ammonia. Free.	Ammonia. Albuminoid.			
342	Surat ..	July ..	Jail Well No. 40	30·10	4·76	·03	·12	Scanty, vegetable debris ..	Bad ..	
343	Do. ..	Do. ..	Do. No. 41	27·30	4·09	·03	·08	Do. do. ..	Fair ..	
344	Do. ..	Do. ..	Do. No. 42	25·20	4·97	·05	·08	Do. do. ..	Do. ..	
345	Do. ..	Do. ..	Do. No. 43	25·90	4·76	·09	·06	Do. do. ..	Do. ..	
346	Do. ..	Do. .	Do. No. 44	23·80	4·69	·01	·07	Do. do. ..	Do. ..	
347	Do. ..	Do. .	Do. No. 45	31·50	4·83	·01	·08	Do. do. ..	Do. ..	
348	Do. ..	Do. ..	Do. No. 46	35·00	4·83	·04	·09	Do. do. ..	Do. ..	
349	Do. ..	Do. ..	Do. No. 47	130·90	54·55	·01	·16	Do. do. ..	Bad ..	
350	Do. ..	Do. .	Do. No. 48	20·30	1·54	..	·04	Do. do. ..	Fair ..	
351	Do. ..	Do. ..	Do. No. 49	32·20	4·83	·10	·22	Do. do. ..	Bad ..	
352	Do. ..	Do. ..	Do. No. 50	35·00	4·83		·10	Do. do. ..	Fair ..	
353	Do. ..	Do. ..	Do. No. 51	34·30	4·90	·07	·10	Do. do. ..	Do. ..	
354	Do. ..	Do. ..	Do. No. 52	35·70	4·90	·07	·08	Do. do. ..	Do. ..	
355	Do. ..	Do. ..	Do. No. 53	33·60	4·90	·01	·09	Do. do. ..	Do. ..	
356	Do. ..	Do. ...	Do. No. 54	4·20	0·91	..	·03	Do. do. ..	Good ..	
357	Do. ..	Do. ..	Do. No. 55	6·30	1·26	..	·01	Do. do. ..	Do. ..	
358	Do. ..	Do. ..	Do. No. 56	151·20	50·40	·04	·03	Do. paramœcia	Bad ..	
359	Do. ..	Do. ..	Do. No. 57	81·90	31·00		·01	Do. do.	Do. ..	
360	Do. ..	Do. ..	Do. No. 58	189·00	42·00	..	·05	Do. do.	Do. ..	
361	Do. ..	Do. ..	Do. No. 59	147·80	32·20	·03	·07	Do. do.	Do. ..	
362	Do. ..	Do. ..	Do. No. 60	81·20	18·90	·03	·06	Do. do.	Do. ..	
363	Do. ..	Do. ..	Do. No. 61 .. .	209·30	44·10	·03	·08	Do. do.	Do. ..	
364	Do. ..	August ..	Do. No. 62	29·40	5·18	·04	·11	Do. vegetable debris ..	Do. ..	
365	Do. ..	Do. ..	Do. No. 63	30·80	5·18	·01	·06	Do. do. ..	Fair ..	
366	Do. ..	Do. ..	Do. No. 64	32·20	6·03	..	·07	Do. do. ..	Do. ..	
367	Do. ..	Do. ..	Do. No. 65 .. .	35·00	5·32	·04	·07	Do. do. ..	Do. ..	
368	Do. ..	Do. ..	Do. No. 66	35·00	5·60	·03	·09	Do. do. ..	Do. ..	
369	Do. ..	Do. ..	Do. No. 67	37·80	5·18	·03	·06	Do. do. ..	Do. ..	Executive Engineer.
370	Do. ..	Do. ..	No. 68	35·70	5·60	..	·07	Do. paramœcia	Do. ..	
371	Do. ..	Do. ..	Do. No. 69	0·80	1·54	..	·05	Do. vegetable debris ..	Good ..	
372	Do. ..	Do. ..	Do. No. 70	15·40	3·22		·07	Do. do. ..	Fair ..	
373	Do. ..	Do. ..	Do. No. 71	38·50	5·88	·03	·07	Do. diatoms	Do. ..	
374	Do. ..	Do. ..	Do. No. 72	35·00	6·30	..	·08	Copious, fine clay	Do. ..	
375	Do. ..	Do. ..	Do. No. 73	36·00	5·74	·02	·09	Scanty, monads	Do. ..	
376	Do. ..	Do. ..	Do. No. 74	37·80	5·74	.	·11	Do. do.	Do. ..	
377	Do. ..	Do. ..	Do. No. 75	31·50	5·74	·01	·10	Do. do.	Do. ..	
378	Do. ..	Do. ..	Do. No. 76	132·30	52·75	·01	·03	Do. do.	Bad ..	
379	Do. ..	Do. ..	Do. No. 77	21·00	1·54	·01	·01	Do. paramœcia	Good ..	
380	Do. ..	Do. ..	Do. No. 78	35·70	6·03	..	·09	Do. vegetable debris ..	Fair ..	
381	Do. ..	Do. ..	Do. No. 79	41·30	7·98	..	·09	Copious do. ..	Bad ..	
382	Do. ..	Do. ..	Do. No. 80	58·20	31·14	..	·06	Do. do. ..	Do. ..	
383	Do. ..	Do. ..	Do. No. 81	49·00	10·92	·04	·09	Do. do. ..	Do. ..	
384	Do. ..	Do. ..	Do. No. 82	30·20	8·12	·01	·38	Do. do. ..	Do. ..	
385	Do. ..	Do. ..	Do. No. 83	41·10	7·84	·01	·10	Do. do. ..	Do. ..	
386	Do. ..	Do. ..	Do. No. 84	23·80	1·68	..	·01	Do. do. ..	Fair ..	•
387	Do. ..	Do. ..	Do. No. 85	4·20	1·12	·01	·02	Scanty, paramœcia ..	Good ..	
388	Do. ..	Do. ..	Do. No. 86	11·30	1·12	·27	·14	Do. do. .. .	Bad ..	
389	Do. ..	Do. ..	Do. No. 87	137·90	50·50	·01	·00	Do. vegetable debris ..	Do. ..	
390	Do. ..	Do. ..	Do. No. 88	35·00	9·52	..	·16	Do. do. ..	Do. ..	
391	Do. ..	Do. ..	Do. No. 89	35·00	7·14	·04	·14	Copious do. ..	Do. ..	
392	Do. ..	Do. ..	Do. No. 90	56·70	16·94	..	·13	Do. do. ..	Do. ..	
393	Do. ..	Do. ..	Do. No. 91	41·30	7·28	·03	·10	Do. do. ..	Do. ..	
394	Do. ..	Do. ..	Do. No. 92	34·30	7·14	..	·12	Do. do. ..	Do. .	
395	Do. ..	Do. ..	Do. No. 93	29·40	7·14	·04	·11	Do. do. ..	Do. ..	
396	Yeola ..	May	Well	28·00	2·66	·04	·07	Scanty vegetable debris ..	Fair ..	Chief Engineer, P. W. D., C. D.

Section III.—Government Stores.

32. 664 articles, coming under this section, were examined during the year under report. The articles were :—

Commissariat Stores.

Samples of Malt liquor ...	...	370
,, Lime-juice ...	...	167
,, Tea	...	22
,, Sugar	...	21
,, Sundry foods ...	...	22
,, Soap	...	24
,, Sundries	...	7
		633

Ordnance and other Stores.

Samples of metals and alloys ...	...	3
,, sundry Ordnance stores ...	...	17
,, other Government stores ...	...	11
		31
		664

33. *Malt Liquor.*—The 370 samples of malt liquor examined during the year were forwarded from various stations, having been rejected by Boards as unfit for use. The acidity in the greater number of these samples was found, on examination, to be excessive and was cured by the addition of bicarbonate of soda ; 59 were rejected as incurable.

34. *Lime-juice.*—167 samples of lime-juice from casks tendered by contractors to the Commissariat Department were examined during the past year. Of these, 47 were rejected as being of inferior quality.

35. *Tea.*—22 samples of tea were forwarded for examination from the Commissariat Department, being samples of supplies tendered by contractors. Of the 22 samples, five were rejected as being of inferior quality. The average results obtained from the 17 accepted samples were as follows :—

Specific gravity of a 10 per cent. decoction	...1010·69
Soluble ash, per cent.	... 3·52
Insoluble ash, per cent.	... 2·86
Total ash, per cent.	... 6·38

36. *Sugar and Sundry articles of Food.*—21 samples of sugar were forwarded by the Commissariat Department, all being of good quality. The sundry articles of food consisted of—

(*a*) 9 tins of essence of beef,

(*b*) 3 samples of vinegar,

(*c*) 4 samples of butter,

(*d*) 1 sample of ghee.

All of the above proved to be of good quality. In addition to these,

(*e*) 4 samples of bread, 1 being of good quality, and

(*f*) 1 sample of grain, which was rejected as unfit for use.

37. *Soap.*—24 samples of soap were examined for the Commissariat Department. Of these, 23 were samples of bar-soap and 1 a sample of soft soap. The percentage of water present in each of these samples was reported, to enable the Commissariat to estimate the price to be paid for the supply. The percentages of water in the 11 samples of bar-soap varied from 44·57 to 65·81 per cent. Five of these samples contained less than 50 per cent. of water, 11 over 50 and under 60 per cent., and 7 over 60 per cent. The percentage of water in the sample of soft soap was 27·14.

38. *Sundries.*—7 samples of this class were forwarded for examination during the year. Of these, 6 were samples of kerosine oil and 1 of rose water. The 6 samples of kerosine oil passed the required test, flashing above 77°F. (Abel flash), and the sample of rose water was of good quality.

39. *Metals and Alloys.*—3 samples are classed under this head. Of these—

(*a*) One sample bullet was forwarded by the Small Arms Ammunition Factory, Kirkee, information as to its percentage composition being required.

(*b*) Two samples of zinc from the Telegraph Department were found to be fit for use in batteries.

40. *Sundry Ordnance Stores.*—(*a*) Thirteen samples of tent cloth forwarded by the Bombay Arsenal were found to contain iron.

(*b*) One sample of leather-belt was forwarded by the Bombay Arsenal for examination of a deposit upon the metal mountings.

(*c*) Three samples of spirit from the wet basin, were reported as unlikely to be injurious to health if exposed in the neighbourhood of private dwellings.

41. *Other Government Stores.*—(*a*) Two samples of bichromate of potash, forwarded by the Telegraph Department, were found to be of good quality.

(*b*) Six samples of ink from the Stationery Department were forwarded for report as to their relative quality and fitness for use in Government offices, and were found to be of about equal quality.

(*c*) One sample of quinine from the Medical Stores, Bombay, was found to be of good quality.

(*d*) Two samples of Neat's-foot oil from the Director of Indian Marine, were found to be of good quality.

(*e*) Two samples of essence of beef, one made in Europe and one made in this country, from the Medical Stores, Bombay, were found to be of nearly equal nutritive value.

Section IV.—Customs and A'bka'ri Analyses.

42. During the past year 859 samples were examined for Customs and Ábkári purposes. The 859 samples analysed during the year, are thus classified :—

Samples of wood spirit and methylated spirit ...	... 17
Do. of other imported alcoholic liquids ...	... 234
Do. of country liquor	... 8
Do. of opium, gánja and salt	... 36
Do. of petroleum	... 537
Do. of explosives	... 8
Miscellaneous samples	... 19
	859

43. *Wood Spirit and Methylated Spirit.*—Of the 17 samples examined during the year, 10 were "wood spirit" and 7 methylated spirit. The 10 samples of wood spirit examined were found to be suitable for methylating purposes, and 6 of the samples of methylated spirit were found to be effectively and permanently rendered unfit for human consumption.

44. *Other imported alcoholic liquids.*—234 samples of this class, comprising principally medicinal preparations and perfumes, were analysed during the year, with a view to ascertain their alcoholic strength for the Customs Department. Of these, 55 were free, or practically free from alcohol. The alcoholic strength of the remaining 179 samples, estimated as proof spirit, was as follows:—

Under 20 per cent.	74 samples.
Between 20 and 50 per cent.	27 „
do. 50 and 100 per cent.	45 „
Over 100 per cent.	33 „

45. *Country Liquor.*—8 samples of country liquor were examined for the Customs Department during the past year. Of these 2 were forwarded for the purpose of ascertaining the quantity of copper present. In each of these samples copper was detected, but not to such an extent as to render the liquor unfit for human consumption. In three samples, information was required as to the alcoholic strength of the liquor, and in the three remaining samples as to their quality.

46. *Opium, Gánja and Salt.*—31 samples of this class were examined during the year. Of these, 18 were of opium or suspected opium, 12 of salt and 1 of gánja. Of the 18 opium samples, 8 came from the Bombay Customs, 3 from Surat, 4 from Kaira, 1 from Broach and 2 from Pandharpur. In 5 of the above samples, no opium could be detected, 2 of these being supposed to be opium oil. The remaining thirteen samples consisted, either wholly or in part, of opium. Of the 17 samples of salt examined during the year, 5 were fit for human consumption, the remainder consisting, to a large extent, of Sulphates of Soda and Magnesia. Three of the samples were manufactured on the Somáli Coast and gave the following results upon analysis :—

Calcium Chloride	1·73	3·73	1·49
Magnesium do.	1·38	1·81	1·00
Sodium do.	93·76	85·47	95·49
Do. Sulphate	1·54	3·16	1·30
Moisture	1·07	3·04	·70
Insoluble matter	·52	2·79	·02
	100·00	100·00	100·00

One sample of gánja from Sátára was forwarded for examination and report as to its fitness, or otherwise, for smoking purposes.

47. *Petroleum.*—537 samples were examined during the year under report. Of these 405 were samples from 27 cargoes of petroleum. Of these 27 cargoes,

20, consisting of 1,678,800 cases of Russian oil, came from Batoum, and 7, consisting of 286,300 cases of American oil, came from New York. The 20 cargoes of Russian oil gave the following results upon examination :—"Abel flash" between 80° and 84°F.; Specific Gravity between 812 and 816. The 7 cargoes of American oil gave the following results:—"Abel flash" between 75° and 100°F.; Specific Gravity between 773 and 795. All samples passed the required test.

48. *Petroleum* continued.—The 132 remaining samples classed as petroleum and forwarded by the Customs Department during the year comprised—

(*a*) 31 samples of lubricating oil, 4 of which were found to contain "non-dangerous" petroleum and 1 contained 17 per cent. of "dangerous" petroleum;

(*b*) 42 samples described as "turpentine", 28 of which were found to contain petroleum, 3 of these containing "dangerous petroleum";

(*c*) Seventeen samples variously described and chiefly consisting of paints in which the solvent used was petroleum, gave the following results:—

4	had a flashing point over		200°F. (Abel test.)
8	do.	do.	76°F. (Abel test.)
5	do.	do.	76°F. (Abel test.)

(*d*) In the remainimg 42 samples the quantity of petroleum present was either insignificant or nil.

49. *Explosives.*—Eight samples are included under this head, all of which were submitted to the tests described by the Explosives Act, all passing the required test. The 8 samples comprise 6 samples of Cordite, 1 of Gun Cotton, and 1 of Detonators.

50. *Miscellaneous.*—Nineteen samples are included under this head. Of these (*a*) 17 were samples of wine from the Bombay Customs, 8 of these being forwarded for examination and report as to whether they were genuine or fictitious; four were reported genuine. In the remaining 9 samples information was required as to their fitness for use; all of these were declared unfit for human consumption.

(*b*) Two samples of almond oil, one of which was declared genuine.

Section V.—Miscellaneous.

51. The 80 samples of this section are thus classified:—

Samples of food, &c.	... ...	... 5
„ of air	... ...	... 25
„ of mud and sewage	...	... 16
„ of lime-stone, &c.	...	... 8
„ of sundry substances	...	... 26
		80

The 5 samples of food include—

(*a*) Four samples of bread from the Station Hospital, Colába, found to contain 8, 6½, 4½ and 3 grains of alum per pound respectively.

(*b*) One sample of ghee, found on examination to be rancid.

52. *Air.*—25 samples of air, collected in various localities in and about Bombay, were forwarded by the Secretary to the Colába Outfall Committee, in order to compare their results with a view to ascertain the extent of sewage gas contamination in those parts where sewage was openly exposed to the air.

53. *Mud and Sewage.*—14 samples of mud and 2 of sewage were also forwarded by the Colába Outfall Committee, the mud samples having been collected at varying distances from the shore, for the purpose of ascertaining, if possible, by a comparative examination of the results of analysis, the distance to which sewage contamination extended.

54. *Limestone and Mortar.*—8 samples are included under this head, 5 being of lime-stone, 2 of mortar and 1 of Calcium Carbonate. The 5 samples of lime-stone gave the following results:—

	A.	B.	C.	D.	E.
Silicic Acid	1·01	2·19	1·66	·57	1·22
Ferric Oxide and Alumina	1·55	2·26	3·15	·59	2·06
Calcium Carbonate	85·61	93·73	87·89	·56	63·52
Sand, &c.	11·55	1·07	7·17	98·19	32·91
Magnesia	·28	·75	·13	·09	·29
	100·00	100·00	100·00	100·00	100·00

The 2 samples of mortar, forwarded by the Executive Engineer for Irrigation, Poona, gave the following results:—

	A.	B.
Moisture	12·60	14·19
Silicic Acid	14·58	14·82
Ferric Oxide and Alumina ...	43·88	40·98
Calcium Carbonate	6·77	8·62
Sand, &c.	21·65	20·96
Magnesia	·52	·43
	100·00	100·00

55. The sample of Calcium Carbonate was taken from an efflorescence found on the surface of some masonry in course of construction at the Tánsa Water Works.

56. *Sundries.*—26 samples thus classified, include:—

(*a*) 4 samples of Lubricating Oil examined as to their quality.

(*b*) 5 samples of Paint (antifouling composition).

(*c*) 2 samples of Petroleum flashing at 95° and 100° (Abel test) respectively.

(*d*) 3 samples of tent cloth examined with a view to ascertain the cause of their rotting. This was found to be due to mildew, the cotton fibres being packed with spores.

(*e*) 2 samples of "Hydroline," information being required as to whether they were likely to damage the cotton fibre in cloth: no deleterious ingredient was detected.

(*f*) 2 medicinal preparations, forwarded by the City Magistrate, Poona; the contents of these were found to correspond to their respective labels, *viz.*:—Vinum Colchici and Vinum Ipecacuanhæ.

(*g*) 4 samples of Castor Oil, sent for examination by the Inspector of Police, Rajputána-Málwa Railway; these were reported to be samples of pure castor oil.

(*h*) 1 sample of Oil, found to be impure.

(*i*) 2 samples of Red Lead containing much silicious matter.

(*j*) 1 Urinary Calculus which proved to consist largely of uric acid.

57. The duties of Assistant Chemical Analyser were performed by Assistant Surgeon M. G. Deshmukh, M.D., who carried out his numerous duties with the same care and attention as in previous years and to my entire satisfaction.

I have the honour to be,
Sir,
Your most obedient Servant,

T. D. COLLIS BARRY, F.R.S.E., F.C.S., F.I.C.,
Surgeon-Captain,
Acting Chemical Analyser to Government.

B 1451—5

Annual Reports: Report of the Chemical Analyser to Government for the year 1891.

No. 2000.

GENERAL DEPARTMENT.

Bombay Castle, 16th June 1892.

Letter from the Surgeon General with the Government of Bombay, No. S.B.—171, dated 29th March 1892:—

"I have the honour to forward the Annual Report from the Chemical Analyser to Government for the year 1891, and beg to make the following remarks thereon.

"2. The total number of articles examined during the year was 3,306 as compared with 2,803 during the previous year, showing an increase of 503. Of these 1,307 were analysed in connection with 321 medico-legal cases as compared with 1,401 articles in 353 cases during the year 1890. 396 samples of potable water were examined as compared with 250 samples during the previous year. Also 664 samples of Government stores as compared with 298 in 1890, and 859 samples from the Customs and A'bkári Department as compared with 747 in 1890.

"3. Of the 321 medico-legal cases, 151 were cases of real or alleged poisoning of human beings as compared with 190 for the preceding year. Poison was detected in 49·6 per cent. of these cases as compared with 35·3 per cent. in the previous year. In 40 of the cases where poison was detected, the poison employed was arsenic, in 8 copper, in 1 mercury, in 2 pounded glass, in 11 opium, in 5 dhatura, in 4 strychnia, in 1 aconitia, in 1 chloroform, and in 2 other poisons. In the 40 cases where arsenic was detected, 47 persons were poisoned and 26 died, showing a decided increase over the results of the previous year.

"4. The 11 cases of opium poisoning include the poisoning of 15 persons, 5 of whom died, showing a large decrease below that of 1890. In the 5 cases of dhatura poisoning, 7 persons were poisoned and there were no deaths. Copper was used as a poison in 8 cases including the poisoning of 211 persons of whom 11 died. This large number of persons poisoned is principally due to two cases in one of which 200 persons were poisoned owing apparently to the use of dirty copper pots, and 8 in another case. In 4 cases strychnia was used as a poison, as compared with 2 in 1890; the four cases include the poisoning of 7 people all of whom died. In 7 other cases the following poisons were used – aconitia, chloroform, mercury, Flueggia Lencopyrus, and Plumbago Rosea.

"5. 114 cases of animal poisoning, real or alleged, were forwarded for examination during the year as compared with 117 in 1890. In 65 cases poison was detected, 73 animals having died; this is the largest number of fatal cases ever referred for examination. Of the 73 animals, 71 were horned cattle, 1 a dog and 1 a horse. The poisons detected were—Cerbera Thevatia in 13, Plumbago Rosea in 1 and arsenic in 59.

"6. Of the 396 samples of potable water examined as to their fitness for potable purposes, 207 were classed as bad, the remainder being of fair or good quality.

"7. 664 samples of Government stores were examined as compared with 298 during the preceding year, this being more than twice as many as in 1890.

"8. 859 samples were analysed for the Customs and A'bkári Department, this being more than 100 greater than in the preceding year.

"9. In addition, 80 articles classed as miscellaneous were also examined and reported on.

"10. During the year under report an increase of establishment has been sanctioned.

"11. Surgeon-Captain T. D. C. Barry has performed his duties with zeal and ability."

RESOLUTION.—The report has been so fully dealt with by the Surgeon General that it is not necessary for Government to review it further. The

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Governor in Council concurs in the remark of the Surgeon General that Surgeon-Captain Barry has performed his duties with zeal and ability.

W. L. HARVEY,
Under Secretary to Government.

To

The Surgeon General with the Government of Bombay,
The Sanitary Commissioner for the Government of Bombay,
The Municipal Commissioner for the City of Bombay,
The Commissioner of Police, Bombay,
All District Superintendents of Police,
All Collectors, including the Collectors and Deputy Commissioners in Sind,
The Commissioner in Sind,
The Commissioner, N. D.,
The Commissioner, C. D.,
The Commissioner, S. D.,
The Commissioner of Customs, Salt, Opium and A'bkári,
The Revenue Department of the Secretariat,
The Judicial Department of the Secretariat,
The Compiler, General Administration Report for 1891-92,
} With copies of the report.

The Editors' Table, Bombay,
The Editors' Table, Poona, *care of* the City Magistrate, Poona,
The Editor of the *Dhárwár Vritt* (for his own use and for the use of the Editors of other Newspapers in Dhárwár).

The Government of India,
The Secretary of State for India.
} By letter.